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Arboretum bulletin

WINTER
1958

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Arboretum bulletin

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Winter, 1958

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COVER—*Vaccinium simulatum*
Photo by EARL BROWN

Summer to Fall in the Arboretum

B. O. Mulligan

THE most remarkable and unusual fact about the past summer was the drought. From May 1 through August 31 the total rainfall was 2.14 inches, whereas the normal is 4.40 inches; during the two months from June 25 to August 25 rain was only recorded here on three days and amounted to 0.13 inches; for the same period last year it was 2.02 inches, and in 1956 0.85 inches.

All four months set records for high average temperatures. May was almost 2° above the previous record, June 1.3°, July, with 71.7°, produced the highest monthly figure ever attained in Seattle, while August was 3.4° above the normal for that month.

Comparative sunshine figures for the last three years in Seattle will also emphasize the unusual amount we received this year.

	May	*June*	*July*	*Aug.*	*Sept.*	*Total hours*
1958	315	224	385	337	205	1,466
1957	250	204	245	277	256	1,232
1956	296	138	328	280	174	1,216

In consequence of this kind of weather the chief problem for many weeks was to provide sufficient water for our plants, especially those set out during the past year or two and those in drier situations, to prevent them shrivelling from lack of moisture. That we have lost extremely few, and only a comparatively small number have been temporarily checked in their growth, is entirely due to the long-continued efforts of the responsible member of the staff, Gerhard Gilbert, whose labors were extended to the end of the first week in September, a much later date than usual here.

Another result was the exceptional flowering of plants from more southerly regions, the Franklinia shrubs giving the best display in September and early October we have ever seen. Other examples were the pineapple-scented sage *(Salvia rutilans), Nerine Bowdenii* from South Africa in the border on the south side of the greenhouses, and the Californian *Zauschneria, Diplacus (Mimulus) longiflorus* and *Dendromecon Harfordii.* Likewise some of our winter blooming plants started flowering in October, several weeks earlier than normal; the Algerian *Iris unguicularis, Prunus subhirtella* 'Autumnalis', and especially forms of the Japanese *Camellia Sasanqua,* more floriferous and charming than we have seen them for a number of years. *Rhododendron mucronulatum* was in bloom by November 8, an exceptionally early date.

Operations

Because of the drought it has been possible to carry out several useful tasks in places where water usually prevents access. The most important was to build up a wall of broken concrete blocks at the north point of Foster's Island, to aid in preventing more of the erosion which has been steadily eating away the land there in recent years. Another was the clearing of the narrow channel between the Island and the Broadmoor golf course, previously much overgrown with native willows, alders and cottonwoods but now considerably opened up, although more remains to be done along our bank this winter.

The collection of *Rosa* species, planted 1950-51, has been noticeably thinned out, work made necessary by the growth of some vigorous species into or among others of less invasive habits. The appearance of the beds has thereby been much improved and we now have room for planting some newcomers this winter. The spraying program against weeds has been continued with good results, both with 2-4-D on our grass areas and especially with Amino-Triazole in cultivated beds, to try and exterminate those perennial nuisances, quack-grass, horsetail and morning glory *(Convolvulus).* There is now evidence that they can at least be greatly reduced by means of two sprayings with this material during the summer (June and September), but great care must be exercised to avoid splashing it on to other plants, or the leaves will soon show the characteristic loss of green color.

Labor

This year two extra men were employed

part time on our regular budget; they worked a total of 544 hours from April to September.

With the welcome aid of funds from the Arboretum Foundation, Arboretum Unit Council and several garden clubs including Seattle, West Seattle and Mercer Island we were also able to hire two additional men during June, July and August, who worked for 562 hours. With this valuable extra assistance it has been possible to regularly weed all our cultivated areas and thus keep them reasonably clean through the summer months. The dry weather of course also aided considerably in this objective.

During April and May the mapping of our plantings along the west side of Arboretum Drive was continued by two students from the College of Forestry. This work has been performed for the past two years by means of a grant from a private source, but has now terminated.

New Plantings

Five hundred daffodil bulbs, of three kinds ('Damson', 'Dawson City' and 'Trevithian'), have been planted on the bank east of the Madison Street entrance for spring display; these were again presented by the Puget Sound Fuchsia Society, previous donor of bulbs to our plantings.

In or near the peony collection have been placed three groups of lily hybrids, 'Citronella', 'Enchantment' and 'Bellingham hybrids', given by the Juanita Graham Unit No. 30, sponsors of the peony collection.

Groups of anemones, the smaller daffodils, chionodoxas, crocuses and other small spring flowering bulbs were set out this fall beside the trails on the north bank of Woodland Garden. Funds for their purchase were provided by West Seattle Garden Club.

Shrub plantings began again in the Williams Memorial Camellia Garden near the end of September, when sufficient rain had fallen to utilize plants from the lath house; they comprised several forms of *Camellia japonica* and *C. Sasanqua* new to the collections, with Skimmia and Sarcococca to fill in between them. Some judicious thinning and pruning was also carried out to other shrubs and trees in the area, to give more light to certain of the camellias.

A good start has now been made on moving some of the 1,200 young rhododendron plants raised from English or Scottish seeds in 1956 out of the frames south of the west greenhouse, either to the nursery, to the south side of Rhododendron Glen, or to the large rhododendron planting west of the magnolias. In three years many of these have reached 3 to 3½ feet in height and some (of the *Triflorum* Series) will flower next spring. A small new group of 34 Glenn Dale azaleas, one plant of each, has been placed on the east side of Azalea Way close to the picnic tables. The latter, incidentally, have after many years' service been replaced by four new tables constructed for us by the Buildings & Grounds Department on the University Campus, using Forest Service design, slightly modified.

More heathers have been added in this same Azalea bed for both summer and winter flowers, and also along the east bank of Azalea Way, south of Woodland Garden. A collection of ten kinds of Clematis hybrids has been acquired and planted in the northwest lath house.

Educational

From late June through August the nursery foreman, Mr. L. J. Michaud, conducted a series of eight propagation classes for Arboretum Foundation members, and three others for different garden clubs. A demonstration was also given by him on KING-TV Community Workshop program, Saturday, October 11, with Mrs. Page Ballard as interrogator; the latter part of this program, by the Director, illustrated the pruning of a young crab apple tree and various shrubs. Other practical pruning demonstrations were given by him in the Arboretum on November 8 and 22.

Mr. J. A. Witt, Assistant Director, was responsible for programs on KOMO-TV on Mr. Bill Moshier's Garden Digest, first on June 21, secondly on October 5, when a number of uncommon fruits from the Arboretum were displayed, including the med-

lar, persimmon, and European service tree *(Sorbus domestica)*. Since Mr. Moshier's illness in October he has acted as moderator for the program each week. Material of interesting plants has also been supplied for it on eight occasions through the summer and fall.

Twenty requests for plant specimens by Arboretum Units or garden clubs were filled from May through September. Conducted tours from mid-May to mid-July numbered 18, twice as many as in the same period of 1957.

The Provisional Class of the Junior League, under Mrs. James D. Rolfe, visited the Arboretum October 7, received a briefing on our organization, aims, uses, and plant collections from the Director, followed by a short but comprehensive tour of the most important sections.

An exhibit of azaleas and rhododendrons, of about 500 sq. ft. in area, was again set up at the Seattle Rhododendron Society's annual show, held at Bellevue May 16-19.

For the first time, telephone inquiries for information reached the 1,000 mark for the months May through September, or 1,003 to be exact. In 1957 the comparable figure was 519; in 1956, 584. In the month of May this year we received 361 such calls, the highest monthly figure ever recorded.

Acquisitions

(a) Seeds and plants

The total number of items received this year, to the end of October, is 879.

For comparison, figures for the previous three years are: 1957, 1,006; 1956, 1,625; 1955, 833.

Those for 1956 indicate the unusual efforts made to replace the plant losses caused by the abnormal early freeze of November 1955. 1957 also showed some increase above the more normal figures of 1955 and 1958, for the same reason.

Some particular items of interest during the latter part of this year have been: collections of seeds from the Botanic Gardens at Stalinabad, in southern Asiatic U.S.S.R., Adelaide, South Australia, Christchurch, New Zealand, and Hobart, Tasmania. Plants of five new hybrid azaleas came from Dr. S. L. Emsweller, of the U. S. Department of Agriculture, Beltsville, Maryland; of five clones of *Euonymus japonicus* from the University of California at Davis; of four clones of English holly from the Dept. of Horticulture, Oregon State College; several rhododendrons, two roses and a Syringa from Arnold Arboretum, and a great variety of other plants or cuttings from many kind and thoughtful donors. A collection of crabapples, several roses, a birch, willow, hawthorn and other unusual trees and shrubs was purchased from a Canadian nursery.

(b) Books

Twenty-seven titles have been added so far this year. Included are the handsome folio works, "Great Flower Books, 1700-1900", (London, 1956), and "Old Garden Roses", Pt. II, (London, 1957), the former donated by Unit No. 23, the later by the Evergreen Study Club; a reprint of G. R. Shaw's "The Genus Pinus" (Arnold Arboretum, 1941, reprinted 1958), Curtis' "Botanical Magazine", Vols. 19 and 20 (1804), a gift from Unit No. 8, and Vols. 45-46 (1818-19); the recent reference works, "Plant-Buyer's Guide" (6th ed., 1958), "Modern Roses V" (1958), and "Camellia Nomenclature" (6th ed., 1958). The continued growth of our library, in quality as well as quantity, is very much aided by the generous and often repeated donations received from Units, garden clubs and individuals for this purpose; we are much indebted to them.

(c) Donations

Besides those already mentioned, for maintenance and plants, others of special note are:

From the Amateur Gardeners, for the Williams Camellia Garden, $279.69; the Maude Sawyer Unit, No. 19, for a memorial fountain, $250.00; Seattle Garden Club, for plants for Azalea Way, $250.00; Mrs. Corydon Wagner, for new rhododendron plants, $100.00; Unit No. 51, for labels, $35.26; Unit No. 23, (Camellia), for books, $40.00.

Research

In January the Overalls Unit, No. 25, pro-

(Continued on Page 136)

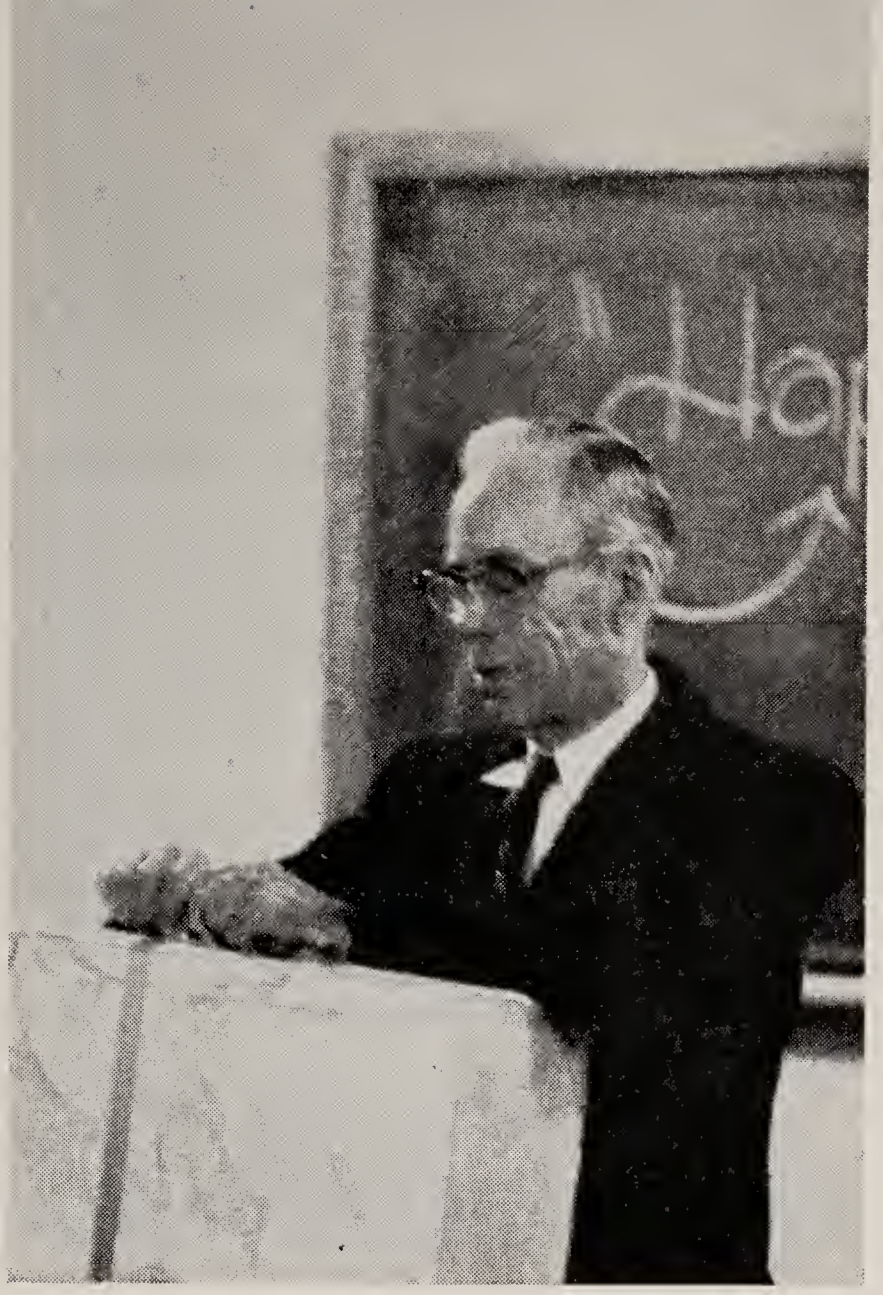
Earl Brown*

In September 1943 a new foreman was hired by the Director of the Arboretum, an unassuming, small but wiry man, aged 55, who had spent most of his life on ranches in Oklahoma, Nebraska and Wyoming, raising cattle, growing corn and other crops. Arboreta and their contents were then outside his experience; this one was young and undeveloped, the period was most difficult for non-essential work, labor and materials, so that the prospects could hardly have seemed encouraging, and yet, as time has proved, no one could have made a better choice.

What was needed then, and for a decade thereafter, was not someone trained in the knowledge and handling of woody plants, but a man well versed in the clearing, preparation, and improvement of all kinds of land, what equipment to use on it and when, able to improvise tools for special tasks when needed, to keep machinery operating when little or no skilled help could be expected, by repairing the old or constructing new parts, and how to make the best use of his men when they finally became available.

Earl A. Brown proved to be all this and more, and for over fifteen years has been responsible for the daily maintenance throughout the entire 250 acres of the Arboretum. In the course of those years he has seen it change from an untidy, semi-wild area to a series of connected grassy vistas, evergreen gardens, and rich collections of trees and shrubs of all kinds. Much of the improvement has been due to his own thought and efforts, aided by the other members of a loyal and responsive staff in carrying out the required work under all kinds of weather conditions through the passing seasons.

That, however, has not by any means been the whole story, for many others in a similar position have probably proved equally diligent. What has given Earl a secure niche in the hearts of all those around him has been



Earl Brown

his continual cheerful willingness to help anyone who needed any kind of assistance which he could give, from the repair or adjustment of some piece of mechanism to thoughtful advice on some serious personal or home problem, providing transportation to or from hospital, or even to tiding someone over temporary financial difficulties. His love of children and their response to him is another prominent characteristic. No wonder that he has been respected and loved for so many years, and that the whole staff of the Arboretum will regret his departure and feel that someone of permanent value and inspiration has left us. We have been fortunate to have him in these important years of development, and evidence of his work will long remain here.

Earl Brown retires from full-time work under the age limit on December 31, 1958, though, fortunately, we shall be able to keep him with us in a part-time capacity for several months beyond that date, until the call of spring, or summer, in Wyoming becomes too insistent. The photograph was taken by J. A. Witt on the occasion of his 70th birthday when a gift was presented to him by members of the Arboretum staff.

B. O. M.

*In honor of Earl, who is an ardent "camera-fan," the cover photo was projected from one of the excellent colored slides he has taken in the interest and for the use of the Arboretum's Educational Program.

Plant Portraits in Color

DAVID METHENY, M.D.*

SUCCESSFUL photography of flowers, trees and shrubs for demonstration purposes requires thought, effort and time. It also requires adequate equipment. Then the pictures will have proper exposure, sharp focus, clarity and reasonable color reproduction, and will perhaps also satisfy the esthetic.

Be sure you know what you wish to photograph. You can show the entire bush or group of bushes; closer up you can show a branch. Very close you can show a single blossom or leaf, even magnifying it on the film itself. This will produce a display on the projection screen that will be equal to viewing the subject through a hand lens.

The following equipment is needed:

1. Tripod. This differentiates the professional from the amateur, the serious worker from the dilettante. It should be strong, have a pan head. For close-ups of near ground-level minutiae a miniature tripod is invaluable. The other alternative is to cut the specimen and put it on a table where a close-up can be taken. The tripod does two important things; (a) it holds the camera steady, and (b) it permits leisurely and accurate viewing of the subject. You may wish to shift the subject a bit, turn it this way or that. I almost said hold the chin down, for it is a portrait that you are taking. Also a shift of camera position, even a foot or two front or back, right or left, up or down may make the difference between not quite showing what you wish or exactly what you want.

2. Shutter-release cable. You will be stupid to be without it.

3. Exposure meter. It is most important to take a reading from the subject to be photographed, and not something else, such as the sky. The reading will not be the same on a large white petal as on dark green leaves. Expose for the one that you wish to show. If your meter shows that the difference in exposure is over two times you will not be able to get both in proper exposure. So make your choice. However, in color film it is usually better to expose for the light areas and underexpose the dark than vice versa. A reading is also false when leaves or branches are wanted against a dark background or shadow which influences the meter reading. Here it is usually better to take a substitute reading on the back or palm of the hand.

I find in this situation that, instead of taking the reading of the light that is coming into the camera from the subject and its neighborhood, going to the object and measuring the light that falls upon it from the direction of the camera is most accurate. This is done with an INCIDENT light meter. The Weston meter has an attachment that converts it into an incident meter. There are others also. It is most important for getting the exposure of close-ups of small buds and flowers.

3. Camera. For this work versatility is the word. Nothing equals the reflex. A focal plane shutter is my choice. With it I have a 35 mm. wide-angle, a 50 mm. "normal," and a 135 mm. telephoto lens. For close-ups I prefer a set of extension tubes. With these I can double the size of the image, using the 35 mm. wide-angle, and even get a ¾ size image through the 135 mm. telephoto. The shutter should have latitude at slow speeds. This is why I prefer my Exakta which has shutter speeds up to 12 seconds.

I prefer an eye level (pentaprism) finder with a split-image focus. It permits rapid and accurate focusing in poor light. I also have a waist-level finder. You can use it to focus on small objects on the ground without lying in the mud.

4. Eastman Kodak neutral test cards. They are eight by ten inches. One side is white and reflects 80% of the light that falls on it.

*Dr. David Metheny, well-known Seattle surgeon, has been putting his photographic talents to good use in quite a different field of anatomy. His unusually fine colored slides will be among those used in *A Survey of the Heath Family*, a 12-hour course being offered at the Arboretum after the first of the year. Here Dr. Metheny tells us just how he achieves these outstanding plant photographs.

The other side is grey and reflects 20%. They make good backgrounds (light or dark) and offer good substitute readings for difficult subjects, as normal subjects also reflect 20% of the light falling on them.

5. Film. I use daylight type. There are many personal opinions.

Kodachrome. It is slow (10 Weston rating), but it has the finest grain. It can be developed by Eastman and probably has the best processing that any of the films have. It emphasizes the blue, and is particularly valuable when you wish to do so. Some professionals use it routinely after three or four o'clock when daylight becomes less blue and warmer.

Ektachrome. Faster (Weston rating 32) and warmer. Not quite so fine grain. Local developing service will likely get your transparencies back sooner, but the technical quality of some local laboratories is not always first class. The film is warmer and is my first choice for reproducing colors that are called flesh tones. It is the film that I am using at present.

Super Anscochrome. A very fine and very fast film (100 Weston rating). An exposure that would require 1/10 second with Kodachrome will take 1/100 second with Super Anscochrome. So, if you had only one chance to take a picture, and the wind was blowing, a 1/500 second exposure might save the day where a 1/50 would only be a blur. In my hands it has very pleasant pastel colors. But it seems to me that the slightest over-exposure fades the blues. Its grain is the coarsest of the three, and will show in some 5 by 7 enlargements. This may be the fault of local processing which has been poor in the past. However, a roll in your kit bag may enable you to get a picture when nothing else would.

Kodacolor. The film to use if you wish color prints instead of transparencies. It also gives fair black and white prints. I have not seen any transparencies from it. The Eastman Co. can correct color discrepancies from unusual light by printing through correction filters. I have not used other films than these three.

Unless otherwise requested, color film today is adjusted for an exposure of about 1/50 of a second. If the exposure varies excessively from this normal, perhaps by 100 times, color imbalance may show in the transparencies.

6. Light. (a) You can take it with you. In that case, use an electronic flash. I prefer one with a color temperature that matches your film (5400 kelvin). Mine is an F.R. that has a color temperature of 5400 and a flash duration of 1/500 second. Some other makes are more convenient to handle, but I notice that they also have shorter flashes and bluer light, and may even require a filter to get correct color on the transparency. My flash has a "guide number" with Ektachrome of about 65. A less powerful light will likely not be satisfactory.

(b) The kind you find there. Your film is balanced for light that occurs when the sun is shining and is two hours or more above the horizon. Just as your film is more sensitive to too much or too little light as compared to the human eye, so it seems to me that it exaggerates deviations from the color it was balanced to. I expect that the technical advisers of the film companies will explain that the film is correct, and that it is the eye that deceives. I assure you that carelessness in this regard can produce horrible pictures. Pictures taken with the sun two hours or less from the horizon will have more yellow or red in them than they should. Likewise, pictures taken in the shade will be too blue. It does not matter if the shade comes from house wall, clouds, or from trees as in a forest.

Professionals use color temperature meters and compensating filters. They are expensive, and also more to carry. You can either come back at a more favorable time as I do, or use your flash. Then you will be able to compare, if you are using the same film for both pictures.

L'envoi. You have your equipment, the film of your choice. The sun is out, and the wind not too strong. You should be wearing your rubbers. You know that the 35 mm. wide-angle lens is usually best to show generous groups of plants. It will also enable you to

(Continued on Page 140)

The Changing Scene*

2. The Crab Apple Collection

Work was begun on this area, which is immediately north of Lake Washington Boulevard between Miller and Roanoke Streets, in the spring of 1946 when a new tractor was available for the task.

Originally, no doubt, it was part of the shoreline of the lake, but had been used as a city garbage dump for some 15 years, being closed in 1936 or thereabouts.

To bring it into a fit state for our purpose a number of young cottonwood trees *(Populus trichocarpa)* had first to be removed, quantities of large brambles rolled down and pulled out, much cultivating done with the tractor, followed by hand removal of pieces of concrete, brick, bottles, rusted metal and so on. Consequently it was not until March 1, 1950, that we were able to start planting; the first picture (fig. 11) shows the scene on that date, looking west down one of the principal grass walks toward the Boulevard, marked by the row of *Populus Simonii* trees. Twenty different kinds were planted that day, from one to three young trees of each, 39 in all; five varieties were hybrids from Manitoba, Canada. Another seven trees were added in April, and the process continued through several falls and springs until the available space was filled.

The arrangement was according to their botanical relationships, keeping allied species, and hybrids as far as possible, in the same bed or area. In practice this has worked out well, since most of the purple-flowered kinds, for example, are grouped together and can be more easily compared. Amongst them we placed *Rosa* species, also arranged in botanical sequence, with two of the beds allotted to 30 plants of old fashioned types of roses, a gift from Lake Washington Garden Club, Unit No. 3.

The second photograph (fig. 12) shows the same view early in April 1958, with the poplar trees in full leaf. In the left foreground is our original tree of the crab apple 'Blanche Ames', raised at the Arnold Arboretum, Boston, given to us in April 1950 and planted December 1951. In the distant center, to the right of the path, 'Sundog' is flowering, one of the best of the Canadian hybrids and among the first group planted.

Growth of all plants in this artificial type of soil has been most satisfactory; heavy dressings of leaves to supply humus have been given almost every winter, followed by a complete fertilizer in spring. Once the plants were established watering has not often been necessary.

In spring the quinces *(Chaenomeles)* in the southeast corner near Miller Street are the first to flower, from late February or early March onwards, followed by the crab apples, beginning with the Siberian crab *(Malus baccata)* and our seedling 'Aspiration' in late March or early April, and ending with the Prairie crab *(Malus ioensis)* and the hybrid 'Prince Georges' late in May, by which time many of the rose species are in bloom. The succession of fruits continues from the latter part of August until December, January, or sometimes even later, depending upon the severity of the winter and the habits and tastes of the birds. *Malus* 'Robusta' holds its heavy crop of small red apples longer than any other variety in our large collection.

B. O. M.

*The first of this series appeared in our Summer 1958 issue.

*If the Evergreen Point bridge is built, then this area will disappear under a cloverleaf connection with the northward extension of Empire Way. If the bridge is placed elsewhere, then perhaps we can not only hold it intact but also extend and further develop its beauty and usefulness for the future.

← *Above:*

Part of the Crab Apple area at first planting, March 1950

FIG. 11 PHOTO BY E. F. (WHITIE) MARTEN

← *Below:*

Same view as in Figure 11—April 1958. 'Blanche Ames' on left.

FIG. 12 PHOTO BY E. F. (WHITIE) MARTEN

Seeds—Their Collection, Cleaning and Storage

J. A. Witt*

A question commonly asked of Arboretum staff members is, "Where do all these plants come from? Do you raise them all from seed?" Actually, a spot count of a large number of acquisitions reveals that nearly 60 per cent of these during the past five years have been in the form of seeds. Most of the seeds which we receive come to us from the international seed exchange (see this *Bulletin,* Fall 1954, p. 96), and one of our chores during the fall and winter months is to collect, clean, store and ship the seeds we offer in this exchange. This experience does not make us experts in the field of seeds, but we have gained some insight in their handling.

Collecting

To take first things first, collecting seeds is a relatively simple process. One watches the fruits of the various plants and when they appear ripe, they are picked. Actually, some experience is necessary or at least desirable in deciding when certain fruits are ready to harvest, but common sense is the best guide. Certain fruits such as the witch-hazels may shed their seeds in a surprisingly short time—less than a day—and one must anticipate this. Others, particularly those with fleshy berries, are very difficult to collect because the birds and squirrels will eat them almost before they are ready. As a general rule, however, one can judge the ripeness of any fruit by watching the stem that holds it to the plant. When this begins to dry and wither it is reasonable to assume the fruit is ready to pick. The ability of a seed to germinate promptly is somewhat dependent on when it is sown, and experience in the Arboretum greenhouse has taught us that the sooner we sow the seed, the sooner will it germinate. Seeds often go through an after-ripening process which almost invariably delays germination. This after-ripening can take place while the seed is still in the fruit hanging on the plant. We find in many cases, roses in particular and members of the rose family in general, such as the mountain ash, crab apples, etc., that seeds from fruits harvested when not quite ripe will give a greater percentage of germination much sooner than those left on the plant to ripen fully.

Cleaning

Collecting seeds is a satisfying work that keeps one out in the open and gives one the feeling of having accomplished much. Cleaning the seeds is by no means such a pleasant task, yet is at least as important as the collection. The seeds must be removed from the fruit for several reasons; first, the fruit if fleshy may rot and so destroy the seeds; second, cleaned seeds are much less bulky to store and ship than those still in the fruit. Seed cleaning ranges from a very simple to a rather complex operation, depending on the type of fruit. Perhaps the rhododendron seed is the easiest of all to clean; one merely picks the capsules when ripe and stores them in a box at room temperature. The capsules soon split open and the seeds fall out. All one has to do is to remove the opened capsules and the cleaned seed remains. Fleshy fruits such as the cotoneaster, cherry, apple, etc., need a bit more fussing with. The pulp has to be removed and the seed retained. For small lots the fruit, provided it is soft enough, may be opened and the stone removed. Often we merely put the fruit into a wide-mouthed jar and squeeze the mass with our hands, a process that soon separates the flesh from the seed. The pulp usually floats and the seeds usually sink, so by using a liberal supply of water one can soon wash away the fleshy portions leaving the seeds in the bottom of the jar. A somewhat more elegant refinement of this process may be used for those fruits with more indurate flesh, or for large lots. We have a "blender" type kitchen mixer in which the metal blades at the bottom of the mixing cup have been replaced with a square of tire casing. The fruit is placed in the blender cup with a small quantity of water and the machine turned on. The hard

*Assistant Director of the Arboretum.

rubber square whirling at a high rate of speed soon reduces the fruit to a soupy pulp, yet leaves the hard-coated seeds with very little damage. The pulp is then decanted, often through a series of screens with progressively smaller mesh in order to catch any errant seeds, though the majority remain in the bottom of the cup.

The seeds are then dried either in the sun or in the boiler room and are ready for storage. The screens mentioned above are essential to some cleaning operations, especially when separating seeds from chaff, as for instance in some of the Spiraea species. Here the fruit is small, in compact heads, and shatters when dry. By putting this mass of dried capsule parts, stems, seeds, and often insects, through the graded screens, one finds that usually one sieve holds the seeds while the other matter may be caught by larger mesh screens or pass on through to the smaller meshes below. If, as sometimes happens, the seeds are the same size as some of the chaff it is possible to winnow them. We use a small electric fan for this purpose, and find that usually the debris will blow away while the heavier seeds remain. Round seeds can sometimes be separated from the irregular chaff by letting them roll down a newspaper held at a shallow angle. Sometimes brute force is useful in cleaning seeds. Removing the fleshy hulls from black walnuts and other such fruit is done by putting them in a gunnysack and running over the sack with an auto or truck. The seeds are hard enough so they don't crack, but the fleshy outer coat is forced off and may be washed away by a stream of water from the hose.

Storage

Storing seeds is probably the most critical of the whole series of operations, yet is the most neglected. Many seeds lose their viability when stored in open containers at room temperatures, which is the way most seeds are stored. There is a great body of literature on seed storage and the general consensus of opinion is that in order to retain viability over a long period, most seeds should be kept at low temperatures, around 38 to 40°F, in air-tight containers. Since we must ship this seed long distances, and must open and close the seed containers many times during the shipping season, we compromise and store them in open packets in a refrigerator kept at about 40°F. This is really just a gesture toward good seed storage technique since when the seed packets are shipped they are placed in manila envelopes and sent via surface mail. Sometimes we find that it takes a month or more for the seeds to reach their destination, thus the time spent in transit may be longer than the actual storage time and our good storage methods are nullified. Shipping all consignments by air mail would be the ultimate answer, but is too expensive at present. Certain seeds with a very short life may be shipped in damp sand or charcoal in a plastic bag and will arrive in reasonable condition. This is true especially of acorns and related nuts.

Yet despite all the vicissitudes the seeds encounter in their travels from plant to seed bed, a reasonable number germinate and thrive; else why should we go to all the trouble and expense of collecting, cleaning, storing and shipping. These remarks, of course, apply also to those we receive from many other sources, especially from overseas, by which we continually enrich our already varied plant collections.

Lath House Reconstruction

Early in December work was begun by a crew of carpenters from the University, aided by our own men, rebuilding the upper lath house, a 200 x 40-foot wooden structure originally erected by the WPA in 1936-37, with a flat roof of thin 2-inch laths. Initial preparations for this were made in 1957, by setting up concrete footings in place of the old 2 x 12-inch western red cedar boards which enclosed the beds.

In the new arrangement the house will be divided longitudinally and have two pitched roofs with a gutter between; heavier 3-inch laths are being set at an angle on the roofs, thus avoiding any dripping on the plants beneath, a serious defect in the old house. All wood is being treated with a preservative before use. By December 15 the job was about one quarter finished; so if the weather is kind to us it should be completed by mid-January; if not, it may be a month or more later. Fortunately no disturbance of the plants has been necessary.

B. O. M.

Adventures in Nature Education at the Morton Arboretum

By MAY THEILGAARD WATTS*

This is the first of an anticipated new series of articles from Botanic Gardens & Arboreta carrying on educational programs. We feel sure that information on what is being done in other institutions will prove illuminating and inspiring to many of our readers.

LET'S LOOK at a typical week of education at the Morton Arboretum. Let's look at last week.

On Saturday afternoon, at 2 o'clock, there assembled in our big lecture room the 153 registered members of the class in "Knowing Trees in Fall." Each one stopped in the hall to pick up his folder with his marked worksheet from the previous week, and his new worksheet. In addition to the regular class members a troop of Boy Scouts, a group of nuns and several other individuals were admitted. After an hour-long lecture, in which there was considerable group participation, the class was divided between five leaders, all members of our advanced group, for a field trip lasting until 5 o'clock. When they went home each one had left in his folder a worksheet and a card on which he had identified ten trees. At the end of this Saturday afternoon course most of them will receive an Arboretum certificate in the mail, but only if it has been earned by active, successful participation in the work of the class. Attendance alone does not earn a certificate.

On Tuesday afternoon members of the Advanced class began setting up exhibits, photographs, maps, in the lecture room. At 5 p.m. the class went on a field trip, conducted by a class member. Then all ate supper together before the open fire in the redwood building. Then came the program, entirely prepared by class members. This year this class is studying the great rivers of the world. Last week it was the Missouri. The field trip visited plants growing in the Arboretum seen by the Lewis & Clark Expedition. (On the evening when we studied the Nile, the leader, facing a different problem, solved it by taking us to plants in our landscape that fill the same ecological niche as plants in the landscape along the Nile). Only students who have earned two or more certificates in other classes of the Arboretum are accepted in this group. Some members have twenty certificates. One fall the class membership included an interesting cross-section, from a 7th grade boy to four men with Ph.D. degrees. The membership this season is 68.

On Wednesday morning the Natural Science group, mainly composed of homemakers, met for one hour of lecture, followed by two hours outdoors. This and the Saturday afternoon group are usually the places at which people start their work in Arboretum classes. Fifty people are accepted in this group each session.

On Wednesday afternoon a lecture was given to garden club groups. These groups were given a tour through the Arboretum in our open-air bus, conducted by one of our advanced students. There were three clubs attending the lecture, and three 1-hour tours given, before or after the lecture. On Friday afternoon a similar program was offered to another group of clubs.

On Thursday morning the group in Field Ecology met at 10 o'clock in the Sand Dunes of Indiana, for a field trip lasting from 10 a.m. to 4 p.m. Trips have been taken to prairie, canyon, filling lake, and bog. Fifty members were accepted in this group, but the waiting list was a long one. No one was accepted who had not had our regular course in Ecology, as well as two general courses in Natural Science, the Spring phase and the Fall phase.

*May Theilgaard Watts is the very capable naturalist at Morton Arboretum, and author of *Reading the Landscape*, a most exciting book on ecology. Her enthusiasm for nature is equalled only by her ability and desire to teach it to others.

On Thursday morning, too, there was a lecture for school groups, given in our large lecture room. 125 pupils with their teachers attended this lecture on trees, which included the playing of a game.

On Thursday evening there was a class on Land Forms and Forces, dealing with rocks and weather. This class has twenty members, and consists of a lecture and class activity.

On Friday morning a lecture was given to 210 high school biology students.

At 4 o'clock on Friday afternoon there was a 1-hour program, with a game and a song, given to Girl Scouts of the Brownie age. Only 55 can be accepted for one of these programs, but the demand is great.

Last week was a fair sample of our class and lecture activity for one of our fall or spring weeks. In winter and summer the program is not so full.

Of special interest in our winter program is our Landscaping Course. This course has been outstandingly popular through the years. Each member, or each couple, constructs a scale model of the actual homesite, and then landscapes it under the supervision and direction of members of the Arboretum staff. Each evening includes not only active work, conferences and discussions, but also a lecture-presentation on plant materials. The finished models are often exhibited in local garden club shows and civic enterprises.

Of special interest in our summer program is the Mothers and Children's course, in which children from six to nine years old, together with their mothers, spend summer mornings that include much activity and much time outdoors, with each meeting ending with the awarding of a feather for a job accomplished, to be worn in the headband.

Another course, usually part of the fall program, is the Junior Forestry Course, to which any 6th grade of our area may send two representatives. These two are given both practice and theory and are sent home to their room group with some definite activity to present. Evidence of successful participation by the members of the home group earns an Arbor Day tree, provided by the Arboretum a week before Arbor Day.

There are other individual courses, that it is tempting to elaborate upon, but here is the program for last year:

		Class Enrollment
	Winter	
Landscaping—45 projects	10 meetings (8 to 10 p.m.)	63
Botany for Gardeners	10 meetings (8 to 10 p.m.)	48
Care & Maintenance of Shade Trees	10 meetings (8 to 10 p.m.)	12
The Vocabulary of Botany	10 meetings (8 to 10 p.m.)	16
Wednesday morning; Nature Literature, a discussion group	10 meetings (10 a.m. to 12)	55
Creative Studies of Plant Materials, an art group	10 meetings (1:30 to 3:30 p.m.)	29
	Total	223
	Spring	
Tuesday evening; Advanced Class	10 meetings (5 to 9:30 p.m.)	93
Wednesday morning; Natural Science	10 meetings (9:30 to 12:30)	47
Thursday morning; Gardening	10 meetings (9:30 to 12:30)	49
Saturday morning; Bird Course	10 meetings (8:00 to 10 a.m.)	47
Saturday morning; Propagating	5 meetings (9:00 to 11:00)	30
Girl Scout Tree Badge Work	5 meetings (10:00 to 12:00)	48
Saturday afternoon; Lecture-field trips	5 meetings (2:30 to 5 p.m.)	159
	Total	473

Linnaeus Field Trip	one day (9:00 to 4:00 p.m.)	33
	Summer	
Exploring Nature Together—2 groups	5 meetings (9 a.m. to 12)	59
Knowing Trees in Summer	5 meetings (7 to 9 p.m.)	33
Forestry for Boy Scouts	5 meetings (7 to 9 p.m.)	59
	Total	151
	Fall	
Tuesday evening; Advanced Group	10 meetings (5:00 to 9:30 p.m.)	68
Wednesday morning; Natural Science	10 meetings (9:30 a.m. to 12:30)	51
Thursday morning; Ecology-field trips	5 meetings (10 to 4 p.m.)	50
Thursday evening; Land Forms & Forces	10 meetings (7:30 to 9:30 p.m.)	21
Saturday afternoon; Lecture-field trips	5 meetings (2:30 to 5 p.m.)	153
	Total	343
Total number taking full courses		1,223

In addition to this program of classes the Arboretum offers, each June, a Nature Workshop. Students are housed in our dormitories and meals are provided. A few students come in by the day, but the real reason for this workshop is so that we may reach beyond our local area. We have had students from many states.

Many people who are not members of classes are served by our three Nature Trails. Each of these has a printed guide and a worksheet. Many teachers take their classes along these trails. On one trail a special worksheet is provided for young children.

Actually, of course, every time a group of shrubs is planted, and carefully labeled on the south side with a sign giving its name, distribution, and date of plantings, this group becomes an educational exhibit. Every time a successful combination of plants has added a diverting note to our landscape, a new bit of education is available for others who use plants. But this is true of all botanical gardens and arboreta.

Our small museum offers another form of education. We try always to have some exhibits that entail active participation.

The herbarium has its own worksheet and a set of herbarium sheets for inspection and comparison. Individuals may ask for the "Herbarium job," and are given a certificate upon completion of it.

Our research department has produced a traveling exhibit on Dutch Elm Disease. This has been used in many garden clubs and in shows in our area.

The physical background for our educational work is a good one. The 1,325 acres of the Arboretum offer native forest, a piece of prairie, landscape groups, geographical groups, collections, experimental plots, gardens. The Thornhill building with its classrooms, lecture hall, library, laboratory, museum, has been the center of the educational work, especially since the near-by redwood building was added to its facilities, with classroom, kitchen, and dormitories. In 1956, new lecture rooms and greenhouses have been added to the Arboretum Center, with its herbarium, exhibits and libraries. The open-air bus is another outstanding piece of equipment.

Recently there was a change in policy concerning the classes. Until 1957 there was no charge for any class. For the past two years there has been a fee for many of the classes. The usual fee is one dollar for a session consisting of an hour of lecture and one or two hours of activity such as field trips or greenhouse work. Most classes run for ten weeks and cost ten dollars. The application of the fee has seemed to make no noticeable difference in our registration. Most of our classes

(Continued on Page 133)

Arboretum Spotlight

Ilex pedunculosa

Most gardeners coming from the colder parts of the East are struck by the wealth of broad-leaved evergreens which we grow in the Puget Sound region. The English holly, and to a lesser extent the Japanese holly, *Ilex crenata,* are among the most commonly used of these trees and shrubs; the former is so universally grown and so at home with us that one may find bird-sown seedlings in almost any vacant lot. Despite the fact that the English holly is an almost ubiquitous tree, there are many of its relatives that should be better known and more widely grown. The long-stalked holly, *Ilex pedunculosa,* is certainly one of these, yet this native of Japan and China is most rare in local gardens despite its many excellent qualities.

Its leaves are a dark and lustrous green without the spines that make the English holly so distinctive but such a bane to handle. The habit is narrowly erect, and a well-grown plant may be 15 feet tall; in short, it is an amenable specimen for the small garden. The winter months bring out its really outstanding fruit—bright red, about a quarter of an inch across, borne singly or in pairs and threes on long stalks (peduncles, hence the name *pedunculosa),* carried well away from the stems. In fact the predominance of clusters of threes makes one think of the pawnbroker's traditional sign, three gilt balls; in this case three scarlet balls held out from the facade of dark green foliage.

The Arboretum's plants, received in 1937 from the United States Department of Agriculture's Bureau of Plant Introduction, are in the bed of Oriental hollies east of Arboretum Drive, and are now 12 to 15 feet tall, truly handsome specimens when in full fruit.

J. A. Witt

Below:

Fruiting Branch of *Ilex pedunculosa*

Fig. 13 Photo by William Eng

A Visit to The Missouri Botanical Garden

GRACE T. DOWLING

THE Missouri Botanical Garden, or, as it is affectionately called, Shaw's Garden, was started on the country estate of Henry Shaw, an Englishman, who came to St. Louis in 1819. On arriving in this small settlement he quickly recognized the opportunities of trade which were beginning with New Orleans and all stops along the Mississippi River. Success followed rapidly. In 1858, while still a comparatively young man, Henry Shaw was able to buy a country home, then far from the city, which eventually became Shaw's Garden.

On this land he built an impressive Victorian mansion with a high tower and named it Tower Grove Park, which he planned to be a botanical garden for the Washington University at St. Louis. Now the garden is bounded on one side by Tower Grove Avenue and on another by Flora Boulevard, a far cry from a "country" location.

Today the garden is more or less formal in architecture, with broad water-lily pools flanking the entrance. Here are found "some of the finest tropical water lilies ever grown." Most of the hybrids growing in the pools have been developed by the Superintendent of the garden, Mr. G. H. Pring, with whom I visited a short time. He had been in the University of Washington Arboretum about three years ago and was most appreciative of its beauty and its value to the world as a whole.

The outdoor area of Shaw's Garden is divided into units with various plantings. The Italian garden, one of the units, is built around a statue of Juno with beds geometrically arranged and beautifully manicured. The Rose Garden must be magnificent in the rose season but my visit was in late October and there were, of course, few blooms. Many trees and shrubs, generally typical of that region of the United States, are placed in impressive plantings.

The glass houses are imposing, of beautiful architecture, enclosing collections of many groups of plants. The Linnean House was especially interesting with busts of Linnaeus, Thomas Nuttall and Asa Gray above the doorway. There is a Desert House for those plants that naturally live in the desert. The Palm House displays varieties of palms from all parts of the world. The Orchid House is perhaps the most important show place. It contains over 50,000 orchids, many of which are hybrids produced by Mr. Pring. The Floral Display House is one where, from April to November, flower shows are held.

Early in the construction of Tower Grove Park Mr. Shaw became acquainted with Sir Joseph Hooker, director of Kew Gardens in England. Later Sir Joseph visited Mr. Shaw in St. Louis and no doubt became an inspiration to the builder of the American garden. The Economic House is not unlike that at Kew with banana trees, coffee trees, breadfruit, sago, edible cacti and many others.

The city of St. Louis has grown on all sides of the garden until today this is an oasis, a beautiful park surrounded by a chain-link fence in the center of a densely populated city. The original house still stands, furnished almost exactly as it was when Mr. Shaw lived there, and near the house is a mausoleum where there is a life-sized, reclining marble effigy of the founder.

At the turn of every path the beauty of the garden as a whole together with each smaller area enhances the memory of Mr. Henry Shaw. It is, indeed, unique in its conception and a significant addition to a beautiful city.

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Medal Awarded to the Arboretum.

FIG. 14 PHOTO BY WILLIAM ENG

MEDAL AWARDED TO THE ARBORETUM

The Arboretum was agreeably surprised yet highly gratified to be one of the twelve recipients in the United States of the bronze medal struck by the Jardim Botanico, Rio de Janeiro, Brazil, to commemorate the 150th anniversary of the founding of that institution in June 1808.

The medal, received October 3, came to us from Dr. G. H. M. Lawrence, Director of the L. H. Bailey Hortorium, Cornell University, Ithaca, New York, who had been designated by the State Department to distribute them to the honored individuals and institutions, in recognition of the centennial of the birth of Liberty Hyde Bailey, celebrated this year.

Amongst other institutions receiving this handsome medal (fig. 14) are the Fort Worth Botanic Garden, Texas, the Brooklyn Botanic Garden, Missouri Botanical Garden, St. Louis, Mo., New York Botanical Garden, John J. Tyler Arboretum, Lima, Pa., and the Rancho Santa Ana Botanic Garden, Claremont, California.

We are delighted and proud to be one of this notable company, and grateful to Dr. Campos Porto, Director of the Jardim Botanico do Rio de Janeiro for so signally recognizing this Arboretum.

Let's Brag About Our Arboretum Units

The Merry Tillers, Unit No. 53 of the University of Washington Arboretum Foundation, flooded KOMO's Cookbook Quiz Program as a fund-raising project to benefit the Arboretum. Participating contestants were Mesdames Robert Walker and Roger Carter, who came out on top with the grand cash prize.

The group also compiled and printed a cookbook of favorite recipes of members and friends entitled "Green Thumb Gourmet," which was very successful as a fund-raising program for the Arboretum.

Arboretum Plant Collections
I—MAPLES

(Continued from Page 99)
(Fall 1958)

A. pictum Thunb. See A. Mono

A. platanoides L. (1753) Europe; W. Asia
Norway maple
Bonnell Nurseries, Renton, Wash., (1941) (Pl.)
W. B. Clarke & Co., San Jose, Cal. (1947) (Pl.)
Drawing attention by its clusters of yellow-green flowers in spring before the leaves open, this large tree of variable form is also valuable for the butter yellow leaf color in autumn. Ht. 18 ft. Bd.

'ALMIRA' U.S.A.
E. H. Scanlon, Olmsted Falls, Ohio, (1957) (Pl.)
A low growing, umbrella form of this tree. Ny.

'C. F. IRISH' U.S.A.
E. H. Scanlon, Ohio, (1956), (Pl.)
A round headed form. Bd.

'CLEVELAND' U.S.A.
E. H. Scanlon, Ohio, (1956), (Pl.)
Habit upright, oval in outline. Bd.

'CRIMSON KING' France
A. McGill & Son, Fairview, Oregon (1949) (Pl.)
Leaves dark red-purple. Bd.

'ERECTUM' *('Ascendens')* Rochester, N.Y.
Kingsville Nsy., Kingsville, Md. (1949) (Pl.)
Of upright habit. Bd.

'FAASSEN'S BLACK' Belgium
A. McGill & Son, Fairview, Oregon (1955) (Pl.)
Another very dark purplish-red color form. Bd.

'IMPROVED COLUMNAR' Rochester, N.Y.
E. H. Scanlon, Ohio (1956) (Pl.) Bd.

'SCHWEDLERI' Origin unknown
W. B. Clarke & Co., San Jose, Cal. (1947) (Pl.)
Leaves bright red when young. Bd.

A. Pseudo-Platanus L. (1753)
W. Europe to W. Asia
Sycamore maple
A very large tree, not represented in the Arboretum, closely related to our native A. macrophyllum. The forms with colored foliage are more attractive than the typical species.

'ERECTUM' Holland
E. H. Scanlon, Ohio, (1957), (Pl.)
An upright form, selected by the Parks Superintendent of Rotterdam. Ny.

'PURPUREUM' Island of Jersey (1828)
N. D. Marrett, Richmond Beach, Wash. (1956), (Pl.)
Leaves purple beneath. Bd.

A. rubrum L. (1753) S.E. Canada; E. U.S.A.
Red, scarlet or swamp maple.
Bonnell Nsy., Renton, Wash. (1941), (Pl.)
This introduction apparently failed. Later plantings of unknown origin made in 1953. Fall color here orange, not red. This species thrives in Seattle. Ht. 18.5 ft. Bd.

'ARMSTRONG'
E. H. Scanlon, Ohio, (1956), (Pl.)
Of fastigiate form. Arb. Dr.

'COLUMNARE' N.Y.
Kingsville Nsy., Kingsville, Md. (1949), (Pl.)
Of stiff, upright habit. Ht. 11.5 ft. MP

A. rubrum X A. saccharinum
Arnold Arb., Boston, (1956), (Sc.)
Nat. Arb., Washington, D.C., (1957), (Pl.)
An interesting, vigorous hybrid produced at the U.S. National Arboretum, 1933. Ny.

A. rufinerve Sieb. & Zucc. (1845) Japan
K. Wada Nsy., Numazushi, Japan (1940), (Pl.)
W. J. Marchant, Wimborne, England (1947), (Sd.)
Expt. Forest Stn. Kyoto Univ. Japan, (1950), (Sd.)
A close relative of and very similar in foliage to A. capillipes, the leaves turning orange in fall. One or two plants remain of the first introduction. Several plants from the second appear to be natural hybrids; all are attractive small trees. Plants from the third were killed on Azalea Way by the freeze of November 1955. Ht. 27 ft., 1st intro.; 18 ft., 2nd intro. Bd.; WG
Var. albo-limbatum (Hook. f.) Schwerin (1893)
K. Wada, Japan (1940), (Pl.)
A form with leaves splashed silver. One plant remains. Bd.

A. saccharinum L. (1753) S.E. Canada; E. U.S.A.
Silver maple
Bonnell Nsy., Renton, Wash., (1941), (Pl.)
Gardens of the Blue Ridge, Ashford, N.C., (1946), (Pl.)
Former, planted in shady site competing with native trees, are severely handicapped; two of latter by pond have grown faster. Not recommended for small gardens or city streets. None of the numerous foliage variants is grown here. Ht. (a) 30-36 ft.; (b) 21 and 31 ft. Bd.

A. saccharum Marsh. (1785)
E. Canada; E. half of U.S.A.
Sugar, Hard or Rock maple
Bonnell Nsy., Renton, Wash., (1941), (Pl.)
Finch Arb., Spokane, Wash. (1952), (Pl.)
Prof. R. B. Clark, Rutgers Univ., N. J., (1956), (Pl.)
No evidence now of first introduction. Second growing well at south end of Arboretum Drive. Good examples of this species to be seen on Ravenna Blvd., Seattle, coloring red or orange in October. Ht. 16 ft., 20 ft.

'NEWTON SENTRY' (f. columnare (Temple) Harkness (1955)
Kingsville Nsy., Kingsville, Md., (1949), (Pl.)
One of the two principal upright forms. Orig. in Mass. prior to 1871. Planted 2/51; Ht. 14 ft. Bd.

A. Shirasawanum Koidz. (1911) Japan
K. Wada Nsy., Numazushi, Japan, (1940), (Pl.)
The clone 'MURASAME' was received as a form of A. palmatum; it is more closely related to A. japonicum, but the leaves are much smaller, with the petiole as long as the blade, and color little in fall. Growth has been slow. Ht. 5-8 ft. WG

A. Sieboldianum Miq. (1865) Japan
K. Wada Nsy., Numazushi, Japan, (1940), (Pl.)
W. J. Marchant, Wimborne, Dorset, England, (1948), (Sd.)
Bot. Gdn., Univ. of Tokyo, Japan, (1950), (Sd.)
Like the last species, a member of the PALMATA series, with small, long-stalked 9-lobed leaves resembling a reduced Vine maple, but easily distinguished by the pubescence of most parts of the leaves and flowers. Habit upright. Ht. 8-15 ft. (from 1st intro.) WG
var. microphyllum Maxim. (1880)
U.S.D.A., Glenn Dale, Md., (1937), (Pl.) (P.I. 101172)
A smaller-leaved variant. May still exist without a label, but not yet recognized.

A. sinense Pax (1889) C. China
G. H. Johnstone, Cornwall, England, (1954), (Sd.)
Received as A. truncatum; identified at Royal Bot. Gdn., Edinburgh. A very distinct species in series SPICATA with deeply lobed and long pointed leaves. May not be reliably hardy in Seattle. Ny.

A. spicatum Lam. (1786)
E. & C. Canada & U.S.A.
Mountain maple
H. Kohankie & Son Nsy., Painesville, Ohio, (1954), (Pl.)
I. L. Williams Nsy., Exeter, N. H., (1958), (Pl.)
The first introduction failed in too dry a site. Second now in nursery.

A. tataricum L. (1753) S.E. Europe; W. Asia
Tatarian maple
Origin unknown
One of Linnaeus' original nine species founding the genus. Here a large shrub in form, not a tree, and not noticeable for fall color, but this may occur elsewhere. A close relative of A. Ginnala, but leaves less deeply lobed or sharply pointed. Ht. 12 ft. Bd.

A. tegmentosum Maxim. (1856)
Manchuria; Korea
U.S.D.A. Glenn Dale, Md., (1938), (Pl), (P.I. 90654)
Arnold Arb., Boston, Mass., (1949), (Sc.)
In a young state, at least, one of the most attractive maples of series MACRANTHA for the conspicuously striped bark, like that of Moosewood (A. pensylvanicum) and other species. Leaves also similar but smaller, turning orange-yellow in fall. Starts growth early in spring; fls. late April (1954). Ht. (of 2nd intro.) 15 ft. WM

A. tetramerum Pax (1889) Manchuria; Korea
Royal Bot. Gdn., Edinburgh, (1945), (Sd.)
Hillier & Sons Nsy., Winchester, England, (1949), (Sd.)
A small tree of slender growth, belonging to the wholly Asiatic series ARGUTA. Three from the first introduction were planted beside the Blvd. in 1949 but are overshadowed by oaks and were severely damaged by cold in Nov. 1955. Others from second, now 11-13 ft. tall, are in a better location. Our plants may be var. **lobulatum,** from W. China.
Bd.; WM

A. triflorum Kom. (1901) Manchuria; Korea
Hillier & Sons Nsy., Winchester, England, (1950), (Sd.)
Arnold Arb., Boston, Mass., (1953), (Pl.)
A near relative of A. nikoense, in the very distinct series TRIFOLIATA, but having much smaller leaves. Of slow growth; too small yet to show its value here. Ht. (from 1st intro.) 4 ft. WM

A. truncatum Bunge (1835) N. China
Arnold Arb., Boston, Mass. (1953), (Pl.)
U.S.D.A., Chico, Calif., (1958), (Pl.) (P.I. 18578)
Related to the Norway maple and A. Mono, but a much smaller tree (to 25 ft.) than either and hence likely to be of garden value. Planted out 2/58. Ht. 7-9 ft. Bd.

Educational Program

The Arboretum Foundation announces a 12-hour course comprising a survey of the Ericaceae—from Andromedas to Zenobias. These classes will be held at the Arboretum Clubhouse from 10 a.m. to 12 noon on January 27, February 2, 10, 17 and 24, and March 3. Each member of the class will receive an informational booklet, seeds, seeding compost, and plastic propagation box—so there should be some interesting new plant material in your gardens in another year or so.

Some of the Arboretum's generous friends who are camera fans have been taking colored slides showing the botanical aspects, habit, and uses of species in the Heath Family. This unusual collection will be used for these classes and will then be given to the Arboretum.

If you are interested in this course you'd best call EAst 5-4510 immediately—there are only about 15 registrations open, as this goes to press.

* * *

Ornamental trees and shrubs for Northwest Gardens, a 12-week course, will be offered Tuesday evenings from 7 to 9 p.m. during the months of March, April and May, 1959. It will be a survey of trees and shrubs suitable for our climate and soil conditions ranging from conifers to broad-leaved evergreens. While the emphasis will be on plants usually available in our local nurseries, rare and unusual trees and shrubs of horticultural merit will be discussed.

Although the course is not one in landscaping, but rather is designed to acquaint the participants with the best in plant material, the site, location, care and cultural practices for each plant or group of plants will be covered.

In so far as possible the lectures will be illustrated with slides and plant material from the Arboretum and the last two meetings will be devoted to field trips in the Arboretum. The fee is $8.00 for members of the Arboretum Foundation and $10.00 for non-members. The instructor will be J. A. Witt, Assistant Director of the Arboretum.

The Arboretum Bulletin

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ARBORETUM FOUNDATION
OFFICE HOURS
9 a. m. to 4:30 p. m.
Monday through Friday
Phone EAst 5-4510

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Notes and Comment

Compliments

Our *Bulletin* has lately received two spontaneous appreciations which we would like to pass on, since they are largely due to our many kind and knowledgeable contributors, as well as to our photographers, and certainly also to our very cooperative printers.

One was from an editor of a world-famous publishing company in New York: "...I have just been looking over the latest number of your *Arboretum Bulletin,* and it impresses me as the finest periodical among all those being put out by the country's various horticultural institutions. You are to be heartily congratulated for its content, style and appearance." Privately, we feel this is slightly exaggerated.

The second, from one of the leading tree and shrub nurserymen in England, acknowledging a copy of the Fall issue: "I regard this *Bulletin* as one of the best of its kind, and I thank you for sending it to me."

And we also thank all of you who help to make it so.

Newly elected to the Board of Directors for a one-year term were: Mrs. Lloyd D. Adler, Mrs. Edward E. Carlson, Mark Collarino, William D. Shannon, Mrs. Walter Wyckoff and Mrs. Lee C. Davis of Port Townsend.

The following Directors were re-elected for a one-year term: Philip W. Bailey, J. Cebert Baillargeon, Carl M. Ballard, Mrs. Carl M. Ballard, Mrs. Page H. Ballard, John A. Blethen, Prentice Bloedel, Mrs. Prentice Bloedel, Mrs. Lawrence Bogle, Mrs. Frederick A. Bunge, Mrs. Frank Calvert, Mrs. William Calvert, Mrs. John A. Clark, Mrs. J. Thomas Dowling, Roscoe Drummond, Edward B. Dunn, Mrs. Allen B. Engle, Mrs. Henry C. Field, Mrs. Richard E. Fuller, Joseph E. Gandy, Edward I. Garrett, Donald G. Graham, Mrs. Donald G. Graham, Mrs. Mansel P. Griffiths, Mrs. Loren Grinstead, Mrs. Neil Haig, Clinton S. Harley, Mrs. John H. Hauberg, Jr., Mrs. Alexander B. Hepler, Dr. Jackson K. Holloway, Mrs. W. Kirby Holmes, Albert F. Hull, Mrs. Henry C. Isaacson, Mrs. Mark Jensen, Mrs. Arthur J. Krauss, C. B. Lindeman, Mrs. Philip Macbride, Dean Gordon Marckworth, Roy L. Maryatt, Donald K. McClure, Mrs. Alexander McEwan, Miss Anne McFee, Dr. A. H. Meadowcroft, Mrs. Moritz Milburn, Pendleton Miller, Mrs. W. Webb Moffett, Dr. Walter A. Moore, A. R. Munger, Harrison Overturf, W. F. Paddock, Philip Padelford, Mrs. Rex Palmer, Mrs. Frank M. Preston,

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A vexing problem faced by all arboretums and botanic gardens is that of labeling their plants legibly, yet inconspicuously. Nothing is more frustrating to the visitor than to discover a tree or shrub that interests him and then to be unable to find its name. Yet care must be taken to avoid garish or obtrusive labels. We have been struggling with this problem for some time and have tried several types of signs and labels with varying degrees of success. In our latest experiment we have turned to gray and black laminated plastic tags which have the name and other information engraved through the gray layer exposing the black, giving black letters on a gray background. The engraving is being done for us in the sign shop on the campus. Some one hundred of these labels have been hung on the mountain ashes, magnolias, maples and other trees in the new Sorbus collection and in the Magnolia area. Information on the tags include common name, if one exists, scientific name, our acquisition number and country of origin. In the Juniper bed immediately west of the office we have fastened fifteen of the labels to wooden stakes as most of the plants are much too low for the hanging type. These labels are good looking and we hope will prove satisfactory.

Adventures in Nature Education at the Morton Arboretum

(Continued from Page 126)

had waiting lists before we made a charge, and they still do.

The publications of the Arboretum much used in our own work are the Bulletins of Popular Information; worksheets; trail guides.

This account of our educational program and its setting would mean little without an explanation of our guiding principles in this program.

First of all, we have tried to offer meat, meat that needed chewing, rather than the whipped cream confections that often constitute what is called Nature Study.

We have tried to reach all ages, but not simultaneously, and have steadfastly avoided the concept that Nature is primarily for children. Our adult programs are aimed at mature adults, and we consider children people.

We have been greatly blessed by being free of all entangling alliance with credit-seekers. Our students are spurred by no ulterior motives; consequently we deal with real interest. Our classes are based on understanding rather than the accumulation of information.

Every class includes active participation by the student. We use games, songs, nature crafts, worksheets, various testing devices, as well as such activities as pruning, grafting, transplanting in the garden courses, and model-building in the landscape course. We avoid sessions consisting of mental massages for inert, passive audiences.

We have avoided over-emphasis on "good practical information" delivered in separate "How-to-do-it" packages, and have endeavored, instead, to make such practical experiences as gardening, for example, grow out of sound botanical understanding fertilized by a rich compost of history, literature, folklore.

We have avoided making identification a goal, or being satisfied with an interminable busyness of pinning names on to trees, rocks, birds, flowers, and have tried instead to make of identification a means to understanding.

We have tried to avoid deceiving ourselves or our students with the idea that the goal of Nature study is therapy, or crime prevention, or social adjustment, or socially acceptable foundation plantings.

Enough reason for our pursuits is inherent in the pleasure of understanding, in the experience of catching glimpses of what Emily Dickinson called

"Truth's superb surprise."

ARBORETUM NOTEBOOK

This section is particularly designed for notes, information and queries concerning beautiful or unusual plants from growers of all types or experience. We solicit your remarks and ideas, but space limitations may sometimes restrict us to publishing those of the widest interest.

Garden Hints

JANUARY 1959

"Another year has gone—twelve crowded months of weeks and days, of sun and cloud —another page torn from the calendar of our lives." CAPTAIN W. E. JOHNS.

The high lights in January are the catalogs that come almost daily. Most gardeners make long lists of plants, trees, shrubs and seeds and then spend days cutting the lists to fit garden needs and pocketbooks. Nothing is more thrilling than the perusal of these colorful books.

In January it is most easy to note possible garden improvements. Annuals are gone, no leaves are on the deciduous trees, and an imaginary garden is a challenge to every garden owner. Having lived with one's garden for one or many years there may be new ways to give it your own personal touch, different from any others.

Now we should watch for egg masses that are often found just under the surface of the soil. Many slugs and caterpillars may be destroyed before they hatch.

All early spring blooming plants may be given a mulch of compost and later a feeding of bonemeal.

If January should be above the normal temperature trees and shrubs may be planted.

If you planted lily seeds last fall they will appreciate a bit of liquid fertilizer along the rows.

The hybrid Christmas begonia, so popular as gifts, probably belongs to the bulbous *Begonia socotrana*. It should be kept as cool as possible and likes humidity.

Border carnations seem to fill a need in many gardens where more difficult plants fail to respond. They have a magic all their own besides qualifications long accepted. They have wonderful colors, different habits of growth (tall or short), unexcelled perfume, and the forms of the flowers often differ. The glaucous foliage adds interest to the winter garden; they are hardy and easy to propagate. New colors are listed every year, showing their growing popularity. They have been loved and cultivated in England for over 400 years.

The hardy amaryllis *(Lycoris squamigera)* is a summer flowering bulb with surprising beauty. Early in the spring the strap-shaped leaves appear and disappear. Then in August a strong, two- or three-foot leafless stem rises and produces eight or ten clear pink, lily-shaped flowers. Sometimes it is listed as *Amaryllis Hallii* but with whatever name it is worth owning.

FEBRUARY 1959

The ideal of beauty is simplicity and tranquillity. GOETHE.

Two forms of Campanula are valuable ground covers or border plants. *C. Portenschlagiana,* the Dalmatian bell flower, has purple-blue flowers. It loves a confined crevice in a sunny spot among stone steps or on stone walls and is then covered with masses of flowers. *C. Poscharskyana* is a coarser plant with fairly long, leafy prostrate stems which are covered with soft blue bells. It will grow up a wall as well as down and in some gardens becomes a nuisance, but a beautiful one.

Our snow-berry *(Symphoricarpus albus)* deserves more attention for our winter gardens. Against a dark green background its long whippy branches, covered with large white berries, shine on through January and February. Yes, the birds love them, but the bushes are so prolific that they cannot strip them. The bushes should be cut back hard in early spring and in fairly good soil they produce larger berries. A variety, *laevigatus,* is superior to the type.

Pots of geraniums or geraniums planted in the border provide that extra bit of color in

any spot that may seem dull in the summer garden. Pots are easily moved and the foliage, as well as the bloom, is invaluable. Now is the time to begin thinking about geraniums, how many and where to purchase them.

Speaking of "planting pots," geraniums are not the only plants that may be planted this way. Today most nurserymen sell plants already well planted in pots; roses, heathers, azaleas and clematis, fuchsias and whatnots. It is easy to bury a pot in order to experiment with space one is not sure may be the best. The prepared soil in the pot or can is already the best for the plant and one has only to dig a sufficiently deep hole, slip the pot in and water well.

When buying roses do not overlook "Circus." It is not particularly new, having been tested in trial rose gardens in 1953, but it has many important qualities. It is a so-called multicolor rose with colors changing from yellow and red in the bud to paler pinks, reds and yellows in the open flower. The foliage seems disease-resistant and it is valuable for many garden uses, hedges, edgings, mass plantings and individual spot plantings.

I have heard from good authority that *Nepata Mussinii* should be lifted and divided every other year in March. If left undisturbed the blooms become pale and insignificant and the flowers droop almost as soon as they open. Also this authority says the plants should be trimmed back to new growths frequently. It would be easy to check on these statements.

MARCH 1959

"Mortal dooms and dynasties are brief things, but beauty is indestructible and eternal, if its tabernacle be only in a petal that is shed tomorrow." REGINALD FARRER, *"The Rainbow Bridge."*

If you have a dry place in your garden examine the soil; it may not have a texture that retains moisture. Peat-moss helps, but on the other hand there are many plants that prefer a dry situation. All gray-leaved plants take care of themselves fairly well.

When the buds on your camellia bushes drop it is probably due to dryness at the root. Even in a wet spring there may be an impervious spot to keep the water from the tips of the roots.

When looking for a plant not often seen in our gardens I commend the Platycodons. They are closely allied to the campanulas but with more subtle blues. There is a dwarf form, *P. grandiflorus* var. *Mariesii,* about twelve inches high with wide open blooms, scooped a little but not like the bell of the campanulas. To my mind the white variety of Platycodon is very handsome but not as outstanding as the dusty blue ones.

A "rogue" in one's garden is a plant that develops untrue to type from seed.

List of Plant Names

(Continued from Fall, 1958)

Wahlenbergia	for Georg Wahlenberg, Swedish botanist
Waldsteinia	for Count Waldstein-Wartenburg, Austrian botanist
Wallichii	for Nathaniel Wallich, Danish botanist
Wardii	for F. Kingdon Ward, English plant collector
Warscewiczella	for J. von Warszewicz, Polish plant collector
Washingtonia	for George Washington
Watsonia	for Sir William Watson, M.D., naturalist
Wattii	for Sir George Watt, English botanist
Websterianum	for F. G. Webster, of Boston, Mass.
Wedelia	for Georg Wolfgang Wedel, Prof. of Botany
Weldianum	for S. M. Weld
Westringia	for J. P. Westring, Swedish physician
Weyrichii	for D. Weyrich, Russian naval surgeon
Widdringtonia	for Capt. E. Widdrington, English botanist
Wigandia	for Johannes Wigand, German bishop
Wightii	for Robert Wight, M.D., Supt. of Madres Bot. Gdn.
Wilcoxia	for Brig. Gen. T. E. Wilcox
Williamsianum	for J. C. Williams, of Cornwall, England
Wilsonae	for Mrs. E. H. Wilson
Wiltonii	for E. C. Wilton, of Chinese Consular Service
Wisteria	for Caspar Wistar, Prof. in Univ. of Penn.
wolgaricus	of the Volga river
Woodsia	for Joseph Woods, English botanist
Woodwardia	for Thomas J. Woodward, English botanist
Wulfenia	for F. X. von Wulfen, Austrian botanical writer
Wyethia	for N. B. Wyeth, discoverer of this plant

Xanthisma	Gr. dyed yellow
xanthinus	yellow
xanthocarpus	yellow fruited
Xanthoceras	Gr. xanthos, yellow and Keras, horn
xanthocodon	yellow bell
xanthoneurus	yellow nerved
xanthophyllus	yellow leaved
Xanthorhiza	yellow root
Xanthorrhoea	Gr. yellow flow (resin)
Xanthosoma	Gr. yellow body
xanthoxylon	yellow wooded
Xeranthemum	Gr. dry flower
Xerophyllum	Gr. dry leaf
Xylobium	Gr. wood life (growing on trees)
yakusimanum	from Yakusima Island, S. Japan
yedoense	from Yeddo (Japan)
Yucca	native Carib name
yungningense	from Yungning, S.W. China
yunnanense	from Yunnan, S.W. China
zaleucum	very white
Zaluzianskya	from Adam Zaluziansky, physician in Prague
Zamia	loss; name used by Pliny
Zantedeschia	for Francesco Zantedeschi, Italian botanist
Zanthoxylum	Gr., yellow wood
Zauschneria	for J. B. J. Zauschner, Prof. at Prague
Zea	old Gr. name for some cereal
Zebrina	referring to striped leaves
zebrinus	zebra striped
Zelkova	vernacular name in S. Russia
Zenobia	for Queen of Palmyra
Zephyranthes	Gr., flower of the west wind
zeylanicua	of Ceylon
Zigadenus	Gr., yoke and gland
Zingiber	derived from a Sanskrit word
Zinnia	for Zinn, German Prof. of Botany
Zizania	old Gr. name for a wild grass
zizanioides	zizania-like
Zizyphus	an Arabian name
zonalis, zonatus	zoned, banded
Zoysia	for Karl von Zoys, Austrian botanist
Zygocactus	yoke and cactus
Zygopetalum	yoked petals

JERRY MUNRO

HU 6-3409

Nursery and Landscaping

Summer to Fall in the Arboretum

(Continued from Page 116)

vided funds for setting up a mist propagation section at the west end of our propagating house. This, in which the mist spray is controlled by a timing device, has been in operation all through the summer and fall, giving results which vary with the different species used but certainly of great interest to all concerned with propagation for commercial purposes. Our data thus far, covering 48 genera, has not yet been assembled, but the following success has been achieved in rooting cuttings on a small scale.

100% rooted. *Acer carpinifolium; Davidia involucrata; Magnolia Kobus* 'Merrill'; *Styrax japonica*

95% rooted. *Stewartia pseudocamellia* var. *koreana*

80% rooted. *Acer palmatum* 'Wounishiki'; *Quercus Rudkinii*

77% rooted. *Robinia Pseudoacacia* 'Coluteoides'

60% rooted. *Malus* 'Blanche Ames'

50% rooted. *Styrax officinalis*

Failed to root. *Quercus Robur* 'Concordia'; *Pterostyrax hispida*

In 1954 we made a first check of the heights then attained by 62 of our young trees, extending the scheme a year later to include another 41 species. Such genera as Acer, Betula, Ilex, Magnolia, Malus, Pinus and Sorbus were especially well represented.

A third census was taken in September this year by Mr. Witt, covering all those previously measured, one hundred different kinds of trees. The figures have been tabulated for comparison with those of the previous years, and are available to anyone interested. They show that the most rapid growth has occurred in the European mountain ash *(Sorbus aucuparia)* (3.25 ft. per year), the Italian alder *(Alnus cordata)* (3.17 ft.), and a Scots pine *(Pinus sylvestris)* (3.12 ft.). The slowest has been a Jeffrey pine on Foster's Island, averaging three inches per year for four years.

By recording the growth rates regularly over a period of years we should accumulate very useful and interesting figures, which after the next such set of records has been obtained we shall hope to publish, in order to give preliminary information on the trees concerned. We also hope to add others to the list which have been planted in recent years. *(See Page 148 for more details.)*

In conclusion it may be said that the Arboretum has recovered well from the damaging freeze of November 1955, the nursery is full of many excellent young plants awaiting transplanting, our staff is experienced and energetic, and we have many willing part time, unsalaried workers among Foundation, Unit and garden club members to whom we are constantly grateful. If it were not for the Damocletian sword still hanging over our heads, in the strange form of a floating bridge, we would feel very happy about its present state, but until that is removed no peace of mind is possible.

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BOOK REVIEWS

Small Fruits for Your Home Garden, by J. Harold Clarke, Ph. D. Doubleday & Co., New York. 372 pp. Illus. $4.95.

HERE is a book that will appeal to everyone who is interested in any way in any of the small fruits, be it the strawberry, raspberry, blackberry, blueberry, grape, currant, gooseberry or elderberry. Reflected on every page is the author's awareness of the universal eagerness of gardeners not only for sound advice about what to choose and how to grow it but also for basic scientific facts about plant life. Written with skillful simplicity of style and wording, this book is an important and much needed addition to horticultural literature.

An unusual aspect of the book is the author's emphasis upon recent results of agricultural research, which, with some experimenting, may be applied to gardening. That this was done with forethought is shown by his statement in the Introduction (p. x), "It is simply my feeling that this book, giving the essentials of the art of growing small fruits in the garden . . . should also include pertinent basic information supplied by modern research." Showing through this statement is the author's unusual background of horticultural training and experience as student, teacher, research worker, plant breeder, commercial grower and propagator of horticultural plants.

Gardeners, whether beginning amateurs, experienced hobbyists or professionals, and also small-scale commercial growers of small fruits, will find interest-arousing and thought-provoking passages throughout this book, from the first page of the Introduction to the end of the final chapter on "Could I make a few dollars from berries?" High school agriculture students, elementary horticulture teachers, speakers and writers on horticultural topics, in short, anyone interested in any way in the modern science of growing plants, will find this a helpful and stimulating book. To be sure, a new word may be encountered here and there and perhaps a passage now and then will be a bit too advanced for some readers. Such words and passages should stimulate the curiosity and lead to further study and enlightenment.

C. D. SCHWARTZE
Western Washington
Experiment Station,
Puyallup

Maples Cultivated in the United States and Canada, by B. O. Mulligan. Published by the American Association of Botanical Gardens and Arboretums, Philadelphia, 1958. Price $2.00.

THIS handy booklet will surely be welcomed by all who are interested in trees, be it for shade or for ornament, since the maples rank exceptionally high for both purposes. For this same reason also it is particularly useful to have for reference a complete outline of all the species and varieties of this genus which are in cultivation in North America. More so since many of them, though of great merit, are hardly known to the general public.

The geographical distribution of maples, their botanical classification and their propagation are treated in separate chapters. Information is included also on chromosome numbers as far as they have been investigated and on the known maple hybrids. Of greatest importance, however, are the carefully compiled lists which not only make it possible to find out quickly which kinds of maples are in cultivation and where they are but also classify them according to their usefulness into large shade trees, smaller ornamental maples and maples for fall color. One list also enumerates desirable species which so far do not seem to have been introduced into cultivation.

The author has wisely refrained from making definite statements as to the hardiness of the various species and varieties. This depends on numerous imponderables and is quite impossible to pinpoint. Respective hardiness, however, can be deduced from the main list at the end of the booklet which states in which of 24 botanical gardens and arboreta, scattered all over North America, any one of 260 species, varieties and cultivars has been grown successfully. The abbreviations used in this list are explained on Page 16, where the addresses of the various institutions are given also, so that anyone interested may write there for further information.

There is only one minor fault I have to find with this excellent booklet, which is that at no place is it stated at what price it may be purchased. This, certainly, would have been of great convenience to the general public and would have materially assisted in assuring this booklet the wide distribution which it deserves.

H. TEUSCHER
Curator of the
Montreal Botanical Garden

A Summary of the Culture of California Plants at the Rancho Santa Ana Botanic Garden—1927-1950, by Percy C. Everett. The Rancho Santa Ana Botanic Garden, Claremont, Calif. 1957. (paper-bound, 223 pp.). Price not listed.

NORTHWEST gardeners who have had their share of failure and success in attempting to grow native plants of California will want to compare notes with Mr. Percy Everett, superintendent of the Rancho Santa Ana Botanic Gardens. The reader will find a listing of over 1200 native Californians—woody species as well as annuals and herbaceous perennials — each entry being a summary of the horticultural experience enjoyed (or suffered!) by a particular species. The detailed records of each species include the source of the propagules (seed, plants or cuttings), nature of the propagating medium, success of propagation, and fate of the plants in the permanent Garden plantings. The severely demanding conditions of the original Botanic Garden in the Puente Hills of Orange County makes the data on survival useful chiefly to those unfortunate gardeners who may have similar conditions with which to contend. For obvious reasons, data on frost-hardiness that would be most useful to Northwest gardeners could not be given. However, Mr. Everett's

inclusion of specific propagating techniques and his notes on responses to irrigating (mostly adverse!) make a real contribution to the limited information on the culture of California natives. For this reviewer, the best feature of the compilation is the massive and tantalizing list of plants itself. That such a large number of native species are of potential or actual horticultural value is both revealing and enticing. Although many plants in the list would find the Northwest inhospitable, it can be predicted that still many more, hitherto untried in our area, would find suitable garden habitats in the varied regions of the Northwest.

A. R. K.

Colour in the Winter Garden, by Graham S. Thomas. Pp. 220, with eight color plates and 56 black and white illus. (Chas. T. Branford Co., Boston, Mass., 1958). Price $6.50.

THIS is one of the most useful, informative and attractive horticultural books which has been added to our library in a long while; it is also one of the most decorative, thanks to the gifted author's skill in drawing and coloring, since he is responsible for the illustrations as well as the text.

The book is arranged to show in succeeding chapters the value and uses of the wide range of plant material now available for gardens in temperate climates, of which the Puget Sound region is well representative. Beginning with trees and continuing with shrubs, both deciduous and evergreen, and giving separate chapters to heathers, climbing plants, rhododendrons, plants with colored bark, those grown especially for foliage or fruits, then passing to herbaceous and bulbous plants, a wealth of detail is supplied for selections in each category, their histories, hardiness, fragrance, needs or preferences in cultivation, suggestions for placing or appropriate associations, notable examples (in England, since this is of English origin), and criticisms if necessary.

The color plates and drawings are happily placed in the text where they belong and are for the most part excellent representations of the plants concerned, so that anyone unfamiliar with them could, for example, distinguish a snowflake from a snowdrop or *Mahonia japonica* from *M. Bealei*. The plates of *Camellia Sasanqua* 'Crimson King', *Crataegus Carrierei* fruits and *Iris foetidissima* seed pods, and of the Corsican hellebore are artistic productions of great beauty and quality. That of the Hamamelis is perhaps the least satisfactory in reproduction.

The chief lack in this book is a chapter on the coniferous evergreens, which certainly have a place in the winter landscape, as Mr. Thomas is well aware, and especially in colder climates, although he refers to a few very briefly in the chapter on foliage. The grey and green junipers (with the exception of *J. horizontalis)*, the elegant Alaska cedar *(Chamaecyparis nootkatensis)* and the hardy and attractive mountain hemlock *(Tsuga Mertensiana)* are all regrettably omitted.

Toward the end of the book are chapters on Planning a Winter Border, which includes two detailed planting plans, and one of Planting Tables, 30 pages listing the plants in their various categories, with eventual height, spread, period of beauty, color, and time to plant—a very thorough and useful catalogue. An excellent index completes the work, which is printed in an unusually legible type.

Anyone desirous of improving the appearance and extending the use of his garden during the winter and early spring months will find this book the best possible guide to that desirable end.

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Plant Portraits in Color

(Continued from Page 119)

show an entire plant where you do not have enough room to back away with the other lenses. You also know that the 135 mm. (telephoto) lens is much more selective. With it you can single out a single bush yards away, or a single blossom several feet above your head. With your extension tubes it is possible to get an image on your film twice the actual size of the subject. Increase in exposure time is needed as the lens is pushed away from the film by the tubes. At an enlargement of one to one, the lens is just twice as far from the film as when it is set at the usual distances. This means that the exposure must be increased four times. You also know that, for close-ups, the telephoto lens will give you greater depth of focus for any given magnification than the other lenses.

Your subject is in the sunlight. Your camera is on its tripod. You carefully select the view you wish. Then you look through your finder. You will likely try several spots for your tripod, even changing lenses. You see your subject. It fills the picture. Nothing else distracts. Then you focus on the front edge and back edge of your subject and note their distances from your camera. Your final focus will be about one-third of the way in from the front edge. From your camera you will read off the largest lens opening that will have the entire object in focus. A larger opening will make a fuzzy picture. Then you will take a light meter reading, set the shutter,

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wait for a lull in the breeze and push the cable release. You think that the wind shook the flower? Just repeat. You think that the exposure might be off? Repeat one or more exposures at half-stop intervals.

I will close with a story. Several years ago I was in Death Valley. A professional photographer was spending a month there taking pictures. Coming back one afternoon the ranger said, "If we hurry we can take another picture near Pinnacle Peak and get back in time for supper." So they stopped. The photographer viewed the situation, near and far, right and left, low and high. Then he unloaded his equipment and set up his camera. The same procedure was repeated using the ground glass, and changing lenses as required. After the site was selected and the focus taken, the color temperature meter was brought out and eventually the proper compensating color filter selected. Then the exposure meter was read, shutter speed adjusted with the correction for the filter, and the shutter cable tripped.

After the equipment was packed and they were driving again the ranger said, "I thought you said that you would hurry. That took an hour and forty minutes. We will be too late to have supper."

"But I did hurry. Most pictures take me three to three and a half hours."

I spent a week at Death Valley. I also took pictures. But there is this difference. While my pictures were nice, they were just snaps. The professional photographer sold his for $200 each.

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Trees of Rapid Growth in the Arboretum

(2 feet or more per year)

Acer capillipes	9 ft. in 4 years	2.25 ft.
Albizzia julibrissin	6½ ft. in 3 years	2.17 ft.
**Alnus cordata*	9½ ft. in 3 years	3.17 ft.
Betula papyrifera var. *occidentalis*	6½ ft. in 3 years	2.17 ft.
Carpinus caroliniana var. *virginiana*	6½ ft. in 3 years	2.17 ft.
Carpinus laxiflora	6 ft. in 3 years	2.0 ft.
Cercidiphyllum japonicum	8 ft. in 4 years	2.0 ft.
f) *Cupressocyparis Leylandii*	9 ft. in 4 years	2.25 ft.
Gleditsia triacanthos 'Moraine'	7 ft. in 3 years	2.3 ft.
Magnolia Kobus	6½ ft. in 3 years	2.17 ft.
Magnolia Kobus var. *borealis*	8 ft. in 4 years	2.0 ft.
Magnolia obovata	8 ft. in 4 years	2.0 ft.
Malus adstringens	7 ft. in 3 years	2.3 ft.
Malus baccata 'Aspiration'	6 ft. in 3 years	2.0 ft.
Malus toringoides	11½ ft. in 4 years	2.9 ft.
Malus yunnanensis var. *Veitchii*	7½ ft. in 3 years	2.5 ft.
Oxydendrum arboreum	9 ft. in 4 years	2.25 ft.
**Pinus sylvestris*	12½ ft. in 4 years	3.12 ft.
**Sorbus aucuparia* var. *edulis*	13 ft. in 4 years	3.25 ft.
Sorbus decora	9 ft. in 4 years	2.25 ft.
Sorbus domestica	9 ft. in 3 years	3.0 ft.
Sorbus latifolia	9 ft. in 4 years	2.25 ft.

Trees of Slower Growth in the Arboretum

(1 foot or less per year)

Carpinus japonica	1.5 ft. in 3 years	.5 ft.
Cercis chinensis	2.5 ft. in 3 years	.8 ft.
Hamamelis japonica var. *arborea*	4 ft. in 4 years	1.0 ft.
Ilex Aquifolium 'Camelliaefolia'	3 ft. in 3 years	1.0 ft.
Ilex Aquifolium 'Angustifolia'	3 ft. in 3 years	1.0 ft.
Ilex integra	2 ft. in 3 years	.7 ft.
Magnolia Proctoriana	2.5 ft. in 3 years	.8 ft.
Magnolia salicifolia	2 ft. in 3 years	.7 ft.
Magnolia virginiana	1.5 ft. in 3 years	.5 ft.
f) *Magnolia virginiana* x *grandiflora*	2 ft. in 3 years	.7 ft.
Malus florentina	3 ft. in 3 years	1.0 ft.
Malus ioensis	2.5 ft. in 3 years	.8 ft.
Malus Scheideckeri	3 ft. in 4 years	.75 ft.
Malus 'Sundog'	2 ft. in 3 years	.7 ft.
***Pinus Jeffreyi*	1 ft. in 4 years	.25 ft.
Pinus virginiana	4 ft. in 4 years	1.0 ft.
Sorbus discolor	2.5 ft. in 4 years	.6 ft.
Stewartia pseudocamellia	1.5 ft. in 3 years	.5 ft.
Styrax Obassia	3 ft. in 4 years	.75 ft.
Tsuga Mertensiana	3 ft. in 4 years	.75 ft.

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* Of most rapid growth

**Slowest in growth

f) Some growth killed by cold, November 1955

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